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EXAMINER

LAVILLA, MICHAEL E

ART UNIT

PAPER NUMBER

1794

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/566,052 | <b>Applicant(s)</b><br>HOFFMANN ET AL. |  |
|                              | <b>Examiner</b><br>MICHAEL LAVILLA   | <b>Art Unit</b><br>1794                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2006 (Prelim. Amend.).
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060125</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:
2. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 7 and 9-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Regarding Claim 7, it is unclear what is the claimed layer thickness, in view of the “preferably” language. Is it at least 30 microns or at least 40 microns?
5. Regarding Claim 9, it is unclear what is the antecedent basis of the phrase “the whole to be treated”. Is this necessarily the entirety of (1) through (4), or not necessarily?
6. Regarding Claim 11, line 1, it is unclear what is meant by the phrase “such as can be obtained”. It is unclear whether the claimed article is necessarily made by the claimed process set forth in Claim 1. See MPEP § 2173.05(d).

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
8. A person shall be entitled to a patent unless –
9. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
10. Claims 1-5 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirayama et al. JP 06-071427. Regarding Claims 1 and 9, Hirayama et al.

Art Unit: 1794

teaches joining two TiAl parts together by applying nickel layers to each part at the interface, inserting 40Ti20Ni20Zr20Cu brazing alloy therebetween, and heating under vacuum for 10 minutes to form a joint. See Hirayama et al. (Abstract; paragraphs 1-16; Figure 1). The TiAl parts would be expected to constitute TiAl intermetallic since titanium and aluminum form intermetallic phases. Since a joint is formed by heating to 930°C, it would be expected that the brazing alloy melted. See Vollmer USPN 6,149,051 (col. 7, lines 30-33) (teaching the liquidus temperature of 40Ti20Ni20Zr20Cu is 846°C from which it follows that brazing treatment of Hirayama would have melted the braze alloy). Regarding Claim 2, Hirayama teaches that the braze is inserted “face-to-face,” which implies that the respective parts had to be pressed together. Regarding Claim 3, the nickel layer on the other TiAl part may be identified with the claimed second material coating. Alternatively, the entire second TiAl part may be identified as the coating since it coats the first part. Regarding Claim 4, the nickel layer as applied is formed before the brazing operation and so it can be considered “pre-formed sheet,” since a layer can be identified as a type of sheet. As well, Hirayama teaches that the nickel layer can be plasma welded, which implies that the nickel layer was a pre-formed sheet that was welded to the TiAl parts. Regarding Claim 5, Hirayama’s nickel layer covers the TiAl parts and hence constitutes a “covering”.

11. Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Noda JP 2001-205443. Regarding Claim 1, Noda teaches joining intermetallic

TiAl part to a steel part by applying nickel alloy braze foils on each part, introducing a nickel alloy barrier material therebetween, pressing together, and heating to form a joint. See Noda (Abstract; paragraphs 18-53; Figure 1). Since a joint is formed under pressure by heating to 1030°C, it would be expected that the brazing alloy melted. The nickel alloy braze on the titanium part or the nickel alloy barrier may be identified with the claimed nickel layer. Regarding Claim 2, Noda teaches that the respective parts are pressed together. Regarding Claim 3, the entire steel part may be identified as the coating since it coats the first part. Regarding Claim 4, both the braze and barrier are applied as foils, i.e., as "pre-formed sheet." Regarding Claim 5, Noda's nickel layer covers the TiAl part and hence constitutes a "covering". Regarding Claim 7, Noda's foils are 50 to 100 microns, meeting the claimed limitations. Regarding Claims 3 and 8, Noda teaches a barrier of Inconel 600 which is a nickel based alloy. The claim may be interpreted in a manner that this barrier serves as the second metal material and may be considered "coating" foil. The intermetallic TiAl is (1); the nickel braze on (1) is (2); the Inconel 600 barrier is (4); the nickel braze on the steel part is (3). With these identifications, the claimed "fixing" is achieved and all layer relationships as claimed are achieved.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been

Art Unit: 1794

obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama

et al. JP 06-071427 in view of Kato et al. USPN 5,354,422. Hirayama et al. is relied upon as set forth above in the section 102 rejection. Regarding Claim 6, Hirayama et al. teaches that pure nickel layer is to be plated, but does not specifically teach that the layer is electroplated. Kato teaches that an effective manner of plating pure nickel is by electroplating. See Kato et al. (col. 3, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time of the invention to form the nickel layer by electroplating since Hirayama teaches applying the layer by plating and since Kato et al. suggests forming pure nickel layer by electroplating plating as a conventional method of plating.

15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Hirayama et al. JP 06-071427 in view of Warashina et al. USPA 2002/0116828.

Hirayama et al. is relied upon as set forth above in the section 102 rejection.

Regarding Claim 10, Hirayama teaches performing the brazing at a pressure of less than  $1.3 \times 10^{-2}$  Pa and that avoiding oxide formation during brazing is

Art Unit: 1794

desired, but does not teach using vacuum less than  $10^{-3}$  Pa. Warashina et al. teaches that vacuum brazing of titanium parts can be performed at pressures lower than  $10^{-3}$  Pa. See Warashina et al. (paragraph 35). It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the brazing of Hirayama at pressures lower than  $1.3 \times 10^{-2}$  Pa, including less than  $10^{-3}$  Pa, since Hirayama teaches brazing at pressures lower than  $1.3 \times 10^{-2}$  Pa is effective and since Warashina et al. suggests that effective vacuum brazing of titanium parts can be performed specifically at pressures throughout a range that encompasses pressures of less than  $10^{-3}$  Pa.

***Allowable Subject Matter***

16. Claims 11-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
17. None of the reviewed prior art, including Hirayama et al. JP 06-071427 and Noda JP 2001-205443, cited above in the prior art rejections, teaches or suggests composite parts having the claimed sequence of layers with respective compositions.

***Conclusion***

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LAVILLA whose telephone number is

Art Unit: 1794

(571)272-1539. The examiner can normally be reached on Monday through Friday.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil, can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/Michael La Villa/  
Michael La Villa  
Primary Patent Examiner, Art Unit 1794  
22 December 2009**